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AN INVENTORY OF THE VASCULAR FLORA OF MORNINGSIDE NATURE CENTER, ALACHUA COUNTY, FLORIDA

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ABSTRACT. A floristic inventory of Morningside Nature Center in Alachua County, Florida, was conducted from May 2001 to April 2003. From the 112.5-hectare park, 527 vascular plant species were collected (not including hybrids). These included 9 ferns, 5 conifers, and 513 angiosperms (representing 103 families and 310 genera). Of the 527 species, 456 were native to North America north of Mexico and 71 were non-native but naturalized. Five plant communities are recognized in the park: pine flatwoods, which cover 53.6% of the park; sandhills, which cover 21.5% of the park; ruderal areas, which cover 20.1% of the park; cypress swamps, which cover 4.4% of the park; and flatwoods depressions, which cover 0.4% of the park. The plant families best represented at Morningside include the Asteraceae with 71 species, Poaceae with 60 species, Fabaceae with 42 species, Cyperaceae with 32 species, Ericaceae with 15 species, Lamiaceae with 15 species, and Euphorbiaceae with 14 species. The largest genera at Morningside include *Quercus* (11 species and 2 named hybrids), *Desmodium* (9 spp.), *Cyperus* and *Hypericum* (8 spp. each), and *Asclepias* and *Rhynchospora* (7 spp. each). Twenty-two species are new records for Alachua County. Nine species growing at Morningside were found to be at or near the northern or southern limits of their range. Finally, six Florida endemics (or near endemics) were found in the park.

Key Words: Morningside Nature Center, Alachua County, floristics, plant communities, Florida

The floristic study was conducted at Morningside Nature Center (Figure 1). This 112.5-hectare park is located at 3540 East University Avenue in Section 2, Township 10 South, Range 20 East, and Section 35, Township 9 South, Range 20 East, at 29°40′ N and 82°16′ W, in Gainesville, Florida. The elevation of the nature center is 46.3 meters above sea level. Morningside is bordered by state-owned lands to the north, the North Florida Evaluation and Treatment Center to the east, University Avenue to the south, and the Loften Center (part of Alachua County public school system) to the west. The living history farm uses 10 acres of the park (Johnson 1998).

Figure 1. Map of trails at Morningside Nature Center.

The land that was to become Morningside Nature Center was first recorded as being owned by Neamiah Brush in the early to mid-1800s. The first recorded use of the land was for producing turpentine by tapping the numerous pines. In 1903, A. R. Scruggs of Alachua County bought all of the land currently forming Morningside Nature Center and used it for timber and turpentine operations. In 1964, the City of Gainesville bought the land from the federal government for $80,820 and reserved the land for outdoor activities and recreation. Morningside Nature Center was established in 1970, with much help from Marjorie Carr and the Junior Welfare League. Marjorie Carr was a nationally recognized environmentalist in northern Florida. When she learned of the surplus land the city had purchased, she urged the Junior Welfare League to adopt the project of turning this land into a nature park. After the park was established, the Junior Welfare League donated $15,000

and added the Nature Center. In 1973, a living history farm was added to the park. Soon after, a longleaf-pine cabin, two twin-crib barns, a one-room schoolhouse, farm animals, and a vegetable garden were added.

Climate and weather. While northern Florida is geographically rather homogenous, Alachua County's climate differs from that of other North Florida counties because of its unique latitudinal location, distance from the sea, and the variety of surface features. Alachua County has two major seasons, a warm rainy season and a cooler dry season. The warm rainy season lasts from the middle of May to the end of September. About 60 percent of the precipitation occurs in these warm months. Rainfall usually occurs as afternoon thunderstorms, which are generated by surface heating and fed by the convergence of breezes from the Gulf of Mexico and the Atlantic Ocean. The most variable rain for the county is produced by frontal passages during the winter months. An average of 38 frontal systems pass through North Florida during the winter season, 29 during spring, 19 during summer, and 41 during fall according to records kept for 1965 through 1967 (Dohrenwend 1978).

Most of the rainfall in Alachua County occurs in the four months of June, July, August, and September. The most precipitation occurs in August with an average of 208 mm. The average annual rainfall for Gainesville is 1370 mm. November is the month with the lowest amount of rainfall (44 mm). Precipitation is extremely variable from year to year and may deviate from the mean by as much as 40%. Snow is infrequent, but when it occurs, it is light and does not normally accumulate or persist (Dohrenwend 1978).

The average annual pan evaporation for Gainesville is 1674 mm, although true evaporative loss is less than that of pan evaporation. The average annual solar radiation is 156,150 langleys. The greatest amount of solar radiation occurs in May and the least in January. The greatest year-to-year variation occurs in June (Dohrenwend 1978).

The average range in monthly temperature is approximately 13°C and the average difference between daytime and nighttime temperatures is also 13°C. The highest maximum shade temperature recorded was 40°C and the lowest winter temperature was –9°C. The average number of freezes per year is four. The average frost season is 70 days. The average annual soil temperature at a 10 cm depth is 23°C. The warmest month is July and the coldest is February, at that depth (Dohrenwend 1978).

The average monthly minimum humidity is almost always above 40%. There are a few summer days where humidity remains above 70%.

Alachua County usually has light winds. Ninety-five percent of all winds are less than 12 knots, 78% less than 9 knots, 56% less than 6 knots, and there is no measurable wind 22% of the time. The average wind speed for three years of recording was 3 knots. Year round, the winds usually come from the north during the night. During the day, however, the wind can come from any direction (Dohrenwend 1978).

Geology. Florida consists of five natural topographic divisions: the Central Highlands, Tallahassee Hills, Marianna Lowlands, Western Highlands, and Coastal Lowlands. Alachua County lies within the Central Highlands. This area extends from the Georgia state line south to Glades County and lies between the Withlacoochee and St. Mary's Rivers. This region is physiographically diverse and includes swampy plains, thousands of lakes, and hills. The soils are mostly sandy, the sand being derived from Pleistocene marine terraces, the Miocene Hawthorne formation, and the Pliocene Citronelle formation. The altitude varies from less than 12 meters above sea level to the highest point in the peninsula, 99 meters on the summit of Iron Mountain near Lake Wales. The many lakes in this area indicate the occurrence of shallow, soluble limestone below the surface (Cooke 1945).

Morningside is underlain by Ocala limestone. This limestone ranges from pure white to yellow, and is commonly granular in texture, but in some places has become compacted rock due to the deposition of travertine or calcite in its interspaces. In some locations, it is extremely porous because it consists of a loose mass of foraminifers, bryozoans, and other small organisms. The chemical composition of this limestone is extremely uniform. It mostly consists of carbonate of lime and contains as little as two-fifths of one percent of impurities. The thickness of this limestone layer has not been determined due to the erosion of the surface and the inability to identify the bottom (Cooke 1945).

Morningside is situated in the plateau-like region of Alachua County, which has a nearly level topography and ranges in elevation from 45 to 61 meters above sea level (Pirkle 1956). Loose sands at the surface in this area are underlain by an impermeable clay layer, resulting in a radial pattern of drainage from the plateau to surrounding areas.

Soils. There are fourteen different soil types at Morningside Nature Center. These soil types are closely correlated with the various plant communities occurring at Morningside. Candler fine sand, (soil type 2B) is a soil that is excessively drained and is found in deep, sandy uplands, supporting a sandhill community. Millhopper sand (soil type 8B) is

a moderately drained soil that is in irregularly shaped areas in sandhill uplands and slightly rolling hills in pine flatwoods. Tavares sand (soil type 20B) is a deep and sandy soil that is moderately well drained and supports pine flatwoods or sandhill communities. Chipley sand (soil type 28) is a poorly drained soil found in the flatwoods and in transition zones between the flatwoods and sandhills. Sparr fine sand (soil type 50) is a poorly drained soil that is found on rises in pine flatwoods and on smooth or slightly convex slopes in sandhills. Pelham sand (soil type 13), Pomona sand (soil type 14), Wauchula sand (soil type 17), Myakka sand (soil type 48), and Plummer fine sand (soil type 51) are all poorly drained soils supporting a pine flatwoods. Surrency sand (soil type 16) and Monteocha loamy sand (soil type 19) are very poorly drained and found in ponds and in wet depressions in pine flatwoods. Pomona sand, depressional (soil type 25), and Placid sand (soil type 34) are very poorly drained soils in pine flatwoods depressions and drainageways, usually dominated by species characteristic of cypress swamps (Soil Conservation Service 1985).

MATERIALS AND METHODS

A floristic inventory of Morningside Nature Center was conducted from May 2001 to November 2002. Plants were collected by walking through all parts of the park. A map of trails (Figure 1) was used to determine which areas of the park had been thoroughly sampled. Each area of the park was visited as often as possible to ensure proper sampling. The shallow stream on the east side of the park was sampled by walking in it as far as it extended on the Morningside property.

At least two voucher specimens of each species were collected, one being deposited in the University of Florida Herbarium (FLAS) and the other in the Morningside herbarium. Both FLAS and the Morningside herbaria were searched for additional species collections from the park. The plant specimens were identified using mainly Wunderlin (1998), and often referencing Campbell (1983), Clewell (1985), Hall (1978), Wunderlin (1982), and Wunderlin and Hansen (2003).

RESULTS

A total of 536 taxa, including 527 species, were found in 310 genera, which were included in 103 families. These are listed in the Appendix. The largest families, followed by number of species, are Asteraceae (71 spp.),

Poaceae (60), Fabaceae (42), Cyperaceae (32), Ericaceae (15), Lamiaceae (15), Euphorbiaceae (14), Apiaceae (12), Fagaceae (11 plus 2 named hybrids), Plantaginaceae (11), and Rubiaceae (10). The largest genera are *Quercus* (11 spp. plus 2 named hybrids), *Desmodium* (9), *Cyperus* (8), *Hypericum* (8), *Asclepias* (7), *Rhynchospora* (7), *Andropogon* (6), *Dichanthelium* (6), *Ludwigia* (6), *Polygala* (6), *Smilax* (6), and *Xyris* (6).

Twenty-two species are new records for Alachua County. These include *Agalinis purpurea*, *Aristida gyrans*, *Bulbostylis stenophylla*, *Cirsium nuttallii*, *Commelina benghalensis*, *Dalea carnea* var. *carnea*, *Desmodium viridiflorum*, *Dichanthelium strigosum* var. *leucoblepharis*, *Hypericum brachyphyllum*, *Juniperus virginiana*, *Liatris tenuifolia* var. *tenuifolia*, *Ludwigia erecta*, *L. virgata*, *Lygodium japonicum*, *Pogonia divaricata*, *Populus deltoides*, *Sabatia brevifolia*, *Sorghastrum secundum*, *Symphyotrichum adnatum*, *Trichostema setaceum*, *Utricularia juncea*, and *Yucca aloifolia*. Six Florida endemics were also found. These are *Asimina reticulata*, *Arnoglossum floridanum*, *Berlandiera subacaulis*, *Callisia ornata*, *Chrysopsis subulata*, and *Verbesina heterophylla*.

Three species found at Morningside are listed as threatened by Coile (2000): *Pogonia divaricata*, *Sarracenia minor*, and *Zephyranthes treatiae*. *Ctenium floridanum* is listed as endangered (Coile 2000; Florida Natural Areas Inventory 2002). *Osmunda cinnamomea*, *O. regalis*, and *Rapidophyllum hystrix* are listed as commercially exploited (Coile 2000). Ward (1979) listed two of the species as threatened: *Rapidophyllum hystrix* and *Smilax smallii*. None of the species found at Morningside are listed as threatened plants by the Florida Natural Areas Inventory (2002), but two are listed as "U.S. management concerns:" *Pteroglossaspis ecristata* and *Verbesina heterophylla*.

Nine species found at Morningside were found to be near or at the northern or southern limits of their geographic range (Wunderlin and Hansen 2003). Two species were found to be at their extreme southern limit in Alachua County: *Pogonia divaricata* and *Agalinis purpurea*. Species that are near their southern limit are: *Aleurites fordii*, *Andropogon gerardii*, and *Pycnanthemum nudum*. *Aleurites fordii* is naturalized and occurs randomly, but is near its southern limit except for a disjunct population in Citrus County. *Andropogon gerardii* and *P. nudum* are at their southern limit in Volusia County. Several species are near their northern limit in Alachua County: *Aristida gyrans*, *Asimina reticulata*, *Chrysopsis scabrella*, and *Solidago odora* var. *chapmanii*. *Aristida gyrans* is at its northern limit in Clay County, *Asimina reticulata* in Bradford County, and *C. scabrella* and *S. odora* var. *chapmanii* in Columbia County. *Chrysopsis subulata* and *Callisia*

ornata are at their northern limit except for a disjunct population of *C. ornata* that occurs in the panhandle (in Gulf County). *Verbesina heterophylla* is at its western limit in Alachua County.

There were 71 species found in the park that are not native to North America north of Mexico but are considered to be naturalized in Florida (Wunderlin 1998). These species are indicated in the Appendix by an asterisk.

PLANT COMMUNITIES

There are five distinct plant communities at Morningside, as determined from community descriptions in Myers and Ewel 1990. These are pine flatwoods, flatwoods depressions, sandhills, cypress swamps, and various ruderal sites. The four ecosystems are very common in Florida, and each has distinct species of plants and animals, as well as characteristic soil and hydrologic conditions.

At Morningside, prescribed fire is an important management tool and is used on a regular basis to maintain the health of the pine flatwoods and sandhills. This fire schedule keeps weedy species and fast-growing hammock shrubs and trees from invading these plant communities.

Pine flatwoods. Pine flatwoods is the most common plant community found in Florida, covering approximately 50 percent of the land in the state. This percentage was probably greater in the past, but due to habitat destruction, resulting from conversion of land to agricultural purposes, forestry operations, and urban growth, the amount of land covered by undisturbed flatwoods has been significantly reduced (Myers and Ewel 1990; Taylor 1998). This community is also the major constituent of Morningside Nature Center, covering 53.6% of the park (Figures 2, 3).

The occurrence of flatwoods in Florida can be explained by past changes in sea level due to the repeated periods of glaciation that may have begun as early as the Miocene period. When the polar ice caps advanced, large areas of the continental shelf were exposed. Then when the ice caps receded, the sea levels rose and these exposed areas were covered with water. During this time, sand was deposited on these shelves. This sandy soil, along with the low elevation of the land and poor drainage, became the necessary ingredients for the formation of today's flatwoods communities (Myers and Ewel 1990).

Pine flatwoods are characterized by a low elevation and flat topography with acidic, sandy soils that are poorly drained, often

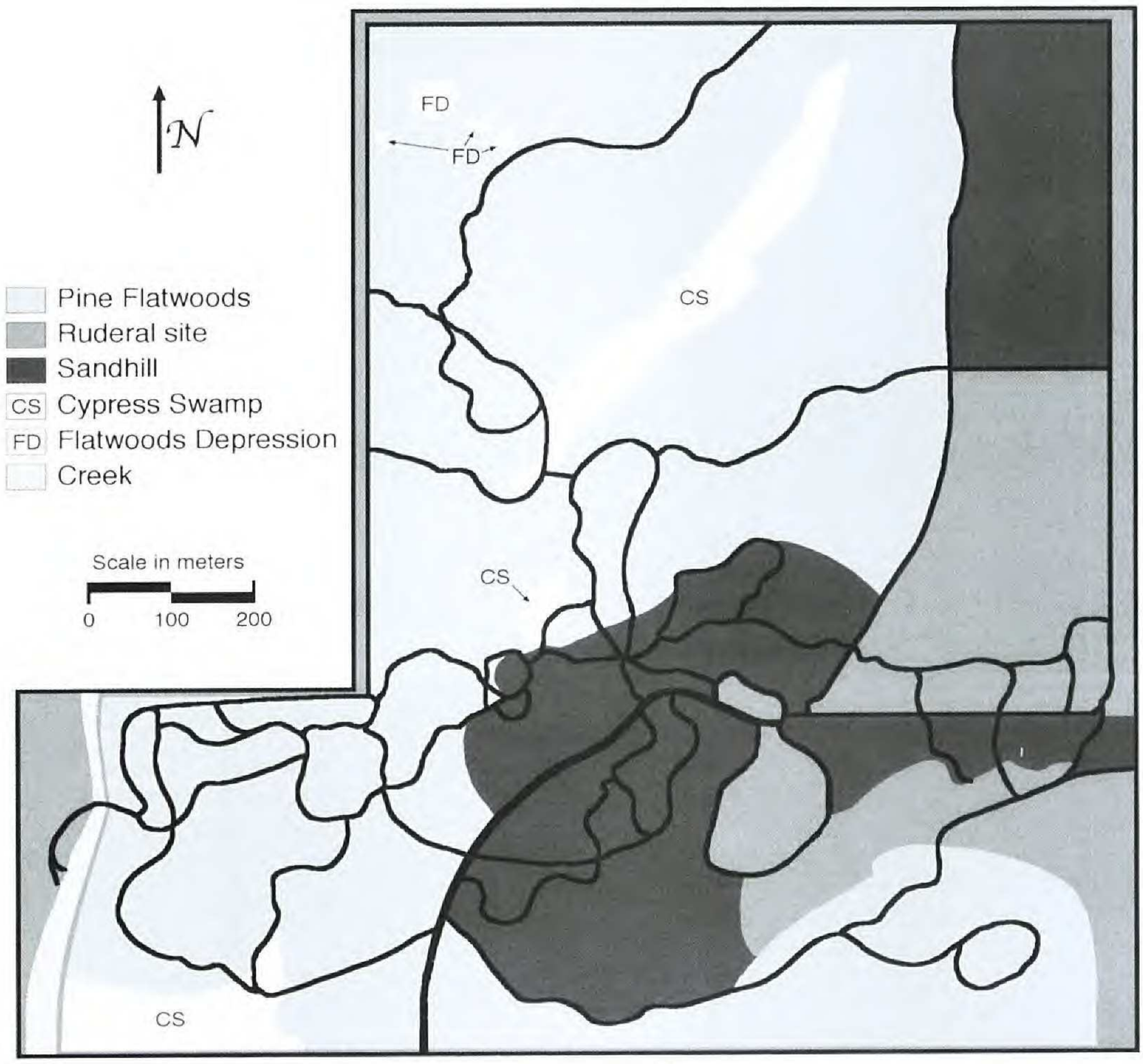

Figure 2. Map of Morningside Nature Center, with delimited plant communities.

underlain by a clay hardpan. The sand is underlain by a compressed organic layer formed by the downward movement of organics as water percolates down through the surface. A hardpan, or a compressed layer of clay often underlies this organic layer. The hardpan is formed in a similar fashion. As water percolates through the soil surface, clay and other fine particles and minerals collect beneath the compressed organic layer, forming the hardpan. The soil is usually fine textured, contains few nutrients, and has very low amounts of clay and organic matter (Myers and Ewel 1990).

During the rainy season, water sometimes stands in flatwoods if a hardpan is present, and water depth exceeds the depth of the soil. In contrast, during the dry season, the sandy soil remains extremely dry because there is not enough water present to reach the surface. Therefore, a droughty condition usually persists during such periods. Any organic material that falls to the ground may lessen the effects of drought and high temperatures. It has been found that moisture levels are much higher

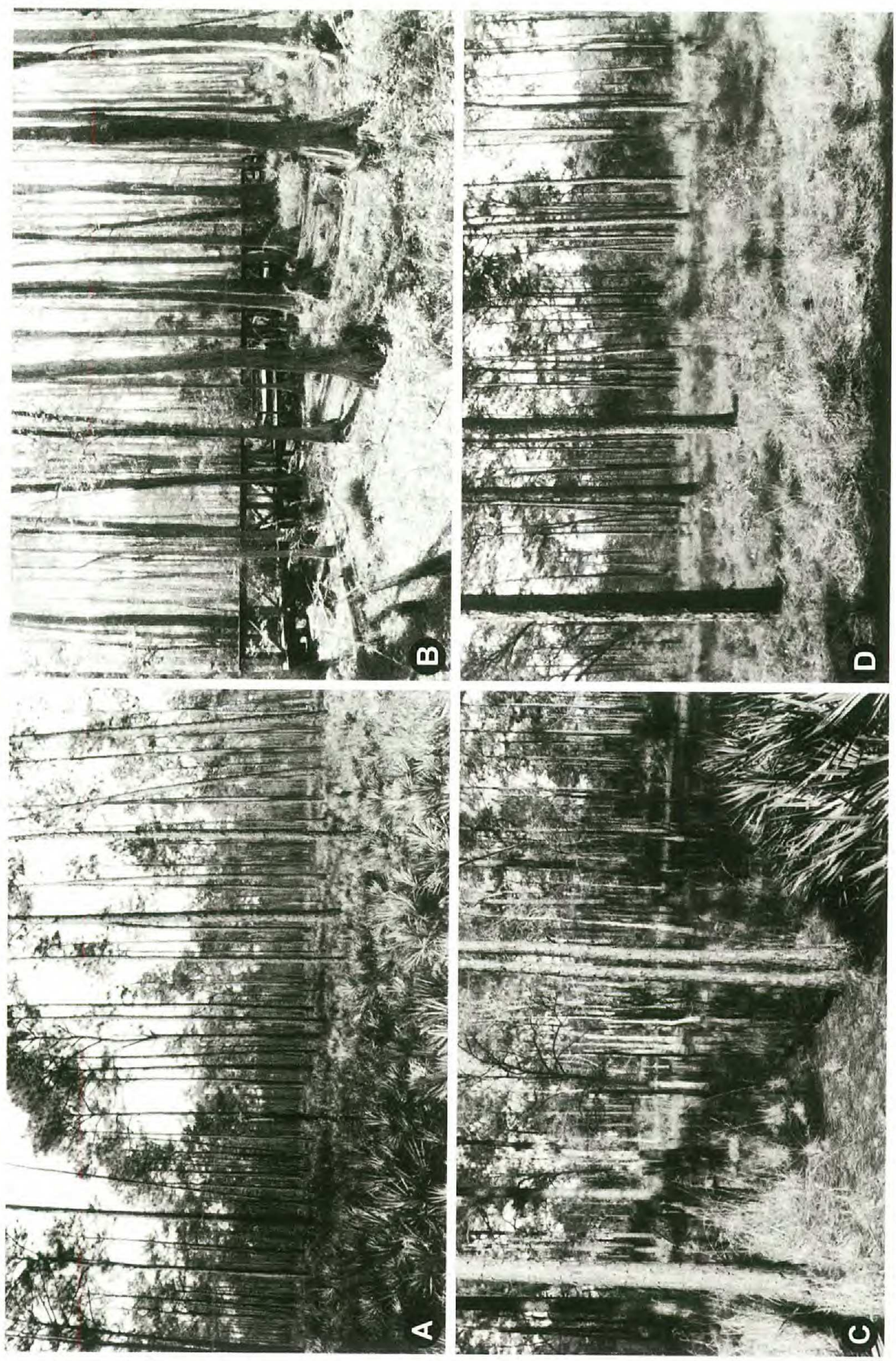

Figure 3. Plant Communities at Morningside Nature Center. A. pine flatwoods. B. cypress swamp. C. flatwoods depression. D. sandhill.

in areas that have not been burned, due to the higher amount of organic litter remaining on the ground (Myers and Ewel 1990).

In the past, natural fires frequently burned flatwoods at one to four year intervals. However, the early settlements of Spanish, followed by English and American settlements in the area, led to a dramatic decrease in the frequency of natural fires. Settlers began farming and also brought livestock to the land; the population increased, which led to the need for roads. These roads and other human constructions acted as barriers to the natural fires, thus causing a decrease in fire frequency. The lack of fire changed the understory of the flatwoods ecosystem, reducing the abundance of herbs, and increasing the dominance of shrubs. It is thought that today's flatwoods are quite different than those of the past, although precise floristic changes are difficult to determine (Myers and Ewel 1990).

The dominant tree species found in flatwoods in Florida are *Pinus palustris*, *P. serotina*, *P. elliottii*, *P. taeda*, *Quercus virginiana*, *Q. nigra*, *Liquidambar styraciflua*, and *Acer rubrum*. Depending on the topology of the area, only one of these pine species may be dominant in any particular place. *Pinus palustris* (longleaf pine) is more fire tolerant than *P. serotina* and *P. elliottii* and is found in higher elevation areas, where there is very rarely standing water at any time of the year. *Pinus elliottii* and *P. serotina* are found in lower elevation areas where water is more prevalent during the rainy season. *Pinus palustris* historically dominated flatwoods, but commercial logging has long since destroyed most of the virgin longleaf pine flatwoods. Because of this logging and suppression of natural fires, all three species of pine are commonly found coexisting in the same area (Myers and Ewel 1990). Commonly, a fourth species of pine, *P. taeda*, also can be found dominating the canopy of the flatwoods. This pine is very fast-growing (Taylor 1998) and quickly colonizes areas that have been disturbed. *Pinus palustris* and *P. elliottii* are the dominant pines in the flatwoods at Morningside (Johnson 1998).

The shrub layer of the flatwoods at Morningside is dominated by *Bejaria racemosa*, *Callicarpa americana*, *Gaylussacia dumosa*, *G. nana*, *Hypericum hypericoides*, *H. tetrapetalum*, *Ilex coriacea*, *I. glabra*, *Kalmia hirsuta*, *Licania michauxii*, *Lyonia lucida*, *Myrica cerifera*, *Quercus minima*, *Q. pumila*, *Rhus copallina*, *Serenoa repens*, and *Vaccinium myrsinites*.

The ground layer consists of a variety of wildflowers and herbaceous species. Dominants include *Aristida stricta* var. *beyrichiana*, *Asclepias pedicellata*, *Carphephorus paniculatus*, *Cirsium horridulum*, *Elephantopus elatus*, *Eupatorium mohrii*, *E. rotundifolium*, *Fuirena scirpoidea*,

Gamochaeta falcata, *Lachnocaulon anceps*, *Oclemena reticulata*, *Polygala nana*, *Pseudognaphalium obtusifolium*, *Pterocaulon pycnostachyum*, *Smilax auriculata*, and *Symphyotrichum walteri*.

Flatwoods depression. The flatwoods depressions, also called flatwoods ponds, depression marshes, or pineland depressions, comprise about 0.4% of the park (Figures 2, 3). These small, shallow, rounded depressions support a unique assemblage of plants due to the ephemeral presence of water. A depression marsh is usually formed when sand slumps over or around a sinkhole and creates a conical depression, which becomes filled by direct rainfall, runoff, or seepage from upland habitats. The soil in these marshes is usually acidic and the center of the depression becomes filled with peat. Fire is important for exclusion of shrubs and trees, and the maintenance of peat. The hydrology of these areas is variable, with most of the depression marshes drying in most years. *Cephalanthus occidentalis* and *Myrica cerifera* are common shrubs found in the depression marshes at Morningside. Typical herbs found in this habitat include: *Agalinis linifolia*, *Lachnanthes caroliniana*, *Pluchea rosea*, *Sagittaria graminea*, *Woodwardia virginica*, and *Xyris caroliniana*.

Sandhill. Sandhills, often called high pinelands, are another common type of community in Florida. Sandhills comprise 21.5% of Morningside (Figures 2, 3). Sandhills are characterized by an open canopy of *Pinus palustris* on rolling sand hills with an open, herb-dominated understory (Johnson 1998; Myers and Ewel 1990). Sandhills were once a very common plant community stretching throughout the southeastern United States from Virginia to eastern Texas. Historically, they provided a great highway through which the early settlers could drive their wagons because of the open canopy and understory (Myers and Ewel 1990).

Like flatwoods, sandhills are fire controlled. Sandhills consist of a unique and varying balance of fire-resistant species that have adapted to the natural fires that sweep through the environment. The life forms in this community are adapted to low-intensity fires that usually occur every one to ten years. Sandhills often grade into other community types such as flatwoods or scrub, and therefore often have many species in common with other plant communities (Myers and Ewel 1990). In fact, it has been hypothesized that presettlement longleaf pine forests occurred on both sandhills and flatwoods. Pollen evidence has shown that the ratio of pines relative to hardwoods in this community has varied over the past 20,000 years. The cause of this fluctuation, however, is still

unknown. The establishment of xeric, fire-adapted species is thought to have greatly increased in the sandhill communities within the last several thousand years. It may have been due to an increase in the frequency of fire, brought about by the agriculture of the Native Americans or an increase in lightning-set fires (Myers and Ewel 1990).

Sandhill formation began as early as the Pleistocene, as ridges possessing coarse, well-drained sands developed. There is much variation in texture, drainage, and fertility of the soil, and because of this variation, it is thought that fire, rather than soil, has been the greatest influence on the patterns of vegetation found in this community. The sand has been derived from marine fluvial deposits and is very low in nutrients (Myers and Ewel 1990).

The vegetation of sandhills consists of a pine canopy, a deciduous oak canopy, and a herbaceous ground cover. Longleaf pine, *Pinus palustris*, is the major overstory species of sandhills. Because of extensive misuse of the land, the virgin longleaf pine forests have been virtually eradicated. This pine is extremely long-lived, reaching ages of more than 500 years. This species is highly fire-resistant and depends on low-intensity fires for its success in the sandhill ecosystem. The trees depend on fire to clear the herbaceous understory, providing bare soil needed for germination. Once a seed germinates, the young tree begins its life as a "grass stage." At this stage, the sapling can easily survive if a fire passes through the area. The apical meristem stays close to the ground and is protected by long, moisture-filled needles. During this period, the sapling builds a long, thick taproot, which stores the water and nutrients the tree will need when it bolts up as a single-stemmed young tree. Rapid bolting soon raises the terminal bud above the fire-level, an advantage if a fire passes through. When the tree is mature, the bark consists of plates, which can flake off when heated in a fire. This dissipates the heat, which protects the trunk from fire damage (Myers and Ewel 1990).

Other common trees found in the sandhill at Morningside include *Quercus incana* and *Q. laevis*. As fire becomes more infrequent, *Diospyros virginiana* becomes frequent. Common shrubs found in sandhills at Morningside include *Asimina angustifolia*, *A. incana*, *A. reticulata*, *Licania michauxii*, *Quercus pumila*, *Rhus copallina*, *Vaccinium myrsinites*, and *V. stamineum*. The understory of the sandhill communities at Morningside include the following herbaceous elements: *Andropogon gyrans*, *Aristida stricta* var. *beyrichiana*, *Balduina angustifolia*, *Berlandiera subacaulis*, *Carphephorus corymbosus*, *Chrysopsis scabrella*, *Cnidoscolus stimulosus*, *Crotolaria rotundifolia*, *Croton argyranthemus*, *Cuthbertia ornata*, *Helianthemum corymbosum*,

Liatris gracilis, *L. pauciflora*, *Opuntia humifusa*, *Palafoxia integrifolia*, *Pityopsis graminifolia*, *Pteridium aquilinum*, *Rhyncospora megalocarpa*, *Rubus cuneifolius*, *Solidago odora* var. *chapmanii*, *Sorghastrum secundum*, *Sporobolus junceus*, and *Stillingia sylvatica*.

The presence of wire grass, *Aristida stricta* var. *beyrichiana*, indicates the health of the sandhill (Myers and Ewel 1990). It is a bunch grass that flourishes under the appropriate conditions and frequent fires. When these conditions are met, the grass forms a dense, vast groundcover. However, many stands of this grass have been eliminated since human settlement. Wire grass spreads very slowly and has actually never been observed creeping into a cleared area, nor does it recolonize an area after being removed. It is also very easily exterminated. It apparently does not frequently grow from seed and often does not even flower. Controlled burning practices are often limited to the winter months, and this fire regime always results in flowering without the production of seed in the wiregrass. It has been found that if the land is burned during the growing season, the grass flowers profusely and produces seed (Myers and Ewel 1990). Therefore, burning regimes should be altered on public and private lands to accommodate this ecologically significant and slowly reproducing species. Fire frequency, intensity, and the season of the fire has profound effects on most species of the sandhill ecosystem. Fire can stimulate seed germination and maintain the understory, but, if not regular, it can also destroy pines and other important species.

Cypress swamp. Cypress swamps encompass approximately 4.4% of the park (Johnson 1998; Figures 2, 3). This ecosystem is the most common type of still-water swamp in Florida, and gets its water supply from shallow, acid groundwater. Such swamps occur in depressions and are usually scattered in poorly drained pine flatwoods. The impermeable clay that underlies the pine flatwoods also underlies the swamp. The rate of decomposition in the swamp is low, and peat accumulates in the depressions. The amount of accumulated organic matter is usually greater than one meter. The water level in these swamps fluctuates greatly, exposing the peat bottom for weeks or even months. Organic acids accumulate in the water, giving it a reddish-brown color, making it impenetrable to light. As a result, phytoplankton cannot survive, which causes the productivity and oxygen level of the swamp to be very low. Fire frequency is moderate and occurs approximately five times per century in a typical cypress swamp. It is thought that these fires burn accumulated organic matter and keep the swamps from becoming mesic ecosystems (Myers and Ewel 1990).

Because of the effects of inundation of the land by water, the plants that grow in the cypress swamps must be able to adapt to the low oxygen and high acid content. As a result, the diversity of these ecosystems is somewhat lower than that of ecosystems that do not have standing water. Also, the diversity found in an area is directly proportional to the amount of time that area is covered by water. The longer an area is submerged, the fewer the number of species that can survive the length of time spent inundated. Having thickened leaves and low transpiration rates are common adaptations for plants living in this ecosystem (Myers and Ewel 1990). Common trees and shrubs found in the cypress swamps at Morningside include: *Acer rubrum*, *Cephalanthus occidentalis*, *Ilex cassine*, *Itea virginica*, *Lyonia lucida*, *Nyssa sylvatica* var. *biflora*, and *Taxodium ascendens*. Common understory herbs are: *Amphicarpum muhlenbergianum*, *Cladium jamaicense*, *Eleocharis vivipara*, *Lachnanthes caroliana*, *Lycopus rubellus*, *Panicum hemitomon*, *Rubus argutus*, *Saururus cernuus*, and *Woodwardia virginica*.

Ruderal. The ruderal habitats roughly cover 20.1% of the park (Figure 2). There are many different disturbed areas at Morningside. For example, the garden near the homestead provides an excellent opportunity for annual weedy species to thrive. The garden is seasonally planted and lays fallow otherwise. Fast-growing species are able to colonize the site. Also, there are many characteristic disturbed or "weedy" species found along the trails, disturbed stream banks, University Avenue and the entrance road, the parking lots, and along the southeast side of the park where the property is adjacent to a housing community. Common trees, shrubs, and vines found in these ruderal areas include *Aleurites fordii*, *Aralia spinosa*, *Cinnamomum camphora*, *Ligustrum lucidum*, *Prunus serotina*, *Sapium sebiferum*, and *Vitis rotundifolia*. Commonly found herbs are *Allium canadense*, *Ambrosia artemisiifolia*, *Cenchrus echinatus*, *Chenopodium ambrosioides*, *Conyza canadensis* var. *pusilla*, *Cyperus croceus*, *Dactyloctenium aegyptium*, *Dioscorea bulbifera*, *Eremochloa ophiuroides*, *Erigeron quercifolius*, *Eupatorium compositifolium*, *Euphorbia cyathophora*, *Paspalum notatum*, *Phytolacca americana* var. *rigida*, *Richardia brasiliensis*, *Setaria parviflora*, *Sida rhombifolia*, *Sporobolus indicus* var. *indicus*, *Stenotaphrum secundatum*, *Wisteria sinensis*, and *Youngia japonica*.

A creek runs along the west side of the park. This area is considered to be ruderal because of constant disturbance caused by dredging the canal. This creek has many dominant species that are unique to this area, including *Cicuta maculata*, *Colocasia esculenta*, *Ludwigia decurrens*,

L. peruviana, *Lygodium japonicum*, *Sesbania punicea*, *Thelypteris hispidula*, and *T. palustris*.

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APPENDIX

ANNOTATED LIST OF SPECIES OF MORNINGSIDE NATURE CENTER

Species nomenclature follows Wunderlin (1998) and the ISB Atlas of Florida Vascular Plants (Wunderlin and Hansen 2003). Nomenclature and circumscription of plant families are based on the APG II (Angiosperm Phylogeny Group 2003) and Judd et al. (2002). Recent taxonomic revisions were also cited for several species. When these recent revisions differed from the taxonomy and nomenclature of Wunderlin (1998), the most recent name was used, and the reference is cited after the species listing.

The species list is arranged alphabetically by family, genus, and species within larger monophyletic groups of ferns, conifers, and angiosperms. Each entry includes the species name, followed by the author or authors (as taken from Wunderlin 1998; Wunderlin and Hansen 2003), the habitat in which it was found, its relative abundance, and the collection number. Collection numbers are those of the first author, with the

assistance of S. Kabat and T. Touchton, unless indicated otherwise. All vouchers listed are housed in FLAS. The communities are: pine flatwoods (PF), flatwoods depression (FD), cypress swamp (CS), sandhill (SH), and ruderal (RU). For abundance, the following categories were used, and were based on the collector's observations of the plants: rare (R; one or very few occurrences), occasional (O; sporadic occurrence), frequent (F; widespread throughout study area or plant community), and common (C; dominants in the plant community). An asterisk (*) indicates non-native taxa that are considered to be naturalized, according to Wunderlin 1998.

FERNS

OSMUNDACEAE. *Osmunda cinnamomea* L. – CS; C; *309*. *Osmunda regalis* L. var. *spectabilis* (Willd.) A. Gray – CS, RU; O; *526*.

POLYPODIACEAE (including Aspleniaceae, Blechnaceae, Dennstaedtiaceae, and Thelypteridaceae, etc.; Judd et al. 2002; Pryer et al. 1995; Saulmon 1971). *Asplenium platyneuron* (L.) Britton et al. – RU; O; *369*. *Pteridium aquilinum* (L.) Kuhn var. *pseudocaudatum* (Clute) A. Heller – PF, SH; C; *270*. *Thelypteris hispidula* (Decne.) C.F. Reed var. *versicolor* (R.P. St. John) Lellinger – RU; O; *371*. *Thelypteris palustris* Schott var. *pubescens* (G. Lawson) Fernald – RU; O; *145*. *Woodwardia areolata* (L.) T. Moore – CS, FD, RU; F; *236*. *Woodwardia virginica* (L.) Sm. – CS, FD; F; *204*, *217*, *245*.

SCHIZAEACEAE. **Lygodium japonicum* (Thunb.) Sw. – RU; F; *367*.

CONIFERS

CUPRESSACEAE (including Taxodiaceae, Judd et al. 2002; Watson 1993). *Juniperus virginiana* L. – RU; O; *289*. *Taxodium ascendens* Brongn. – CS; F; *364*, *626*.

PINACEAE. *Pinus elliottii* Engelm. – PF; C; *493*. *Pinus palustris* Mill. – SH; C; *265*. *Pinus taeda* L. – RU, SH; F; *220*, *365*.

ANGIOSPERMS

ACANTHACEAE. *Dyschoriste oblongifolia* (Michx.) Kuntze – SH; O; *33*, *489a*. *Ruellia caroliniensis* (J.F. Gmel.) Steud. – RU; R; *489b*.

ADOXACEAE. *Sambucus nigra* L. subsp. *canadensis* (L.) Bolli – RU; R; *465*. *Viburnum nudum* L. – PF; O; *354*.

AGAVACEAE. *Yucca aloifolia* L. – RU; O; *538*.

ALISMATACEAE. *Sagittaria graminea* Michx. var. *graminea* – CS, FD, PF; O; *135*, *239*, *608*.

ALLIACEAE. *Allium canadense* L. var. *canadense* – RU; F; *523*.

ALTINGIACEAE. *Liquidambar styraciflua* L. – CS, RU; C; *485*.

AMARANTHACEAE (including Chenopodiaceae). **Alternanthera philoxeroides* (Mart.) Griseb. – RU; C; *142*. **Amaranthus viridis* L. – RU; R; *L.J. Lehtonen 456*. **Chenopodium ambrosioides* L. – RU; C; *254*.

AMARYLLIDACEAE. *Zephyranthes atamasca* (L.) Herb. var. *treatiae* (S. Watson) Meerow – CS; O; *447*.

ANACARDIACEAE. *Rhus copallinum* L. – PF, SH; C; *148*. *Toxicodendron radicans* (L.) Kuntze – RU; C; *190*.

ANNONACEAE. *Asimina angustifolia* Raf. – PF, SH; C; *41*, *59*, *160*. *Asimina angustifolia* Raf. × *A. incana* (W. Bartram) Exell. – SH; O; *653*. *Asimina incana* (W. Bartram) Exell. – PF, SH; F; *15*. *Asimina pygmaea* (W. Bartram) Dunal – SH; O; *161*. *Asimina reticulata* Shuttlew. *ex* Chapm. – PF; O; *285*.

APIACEAE (including Araliaceae; Judd et al. 2002). *Aralia spinosa* L. – RU; F; *475*. *Centella asiatica* (L.) Urb. – RU; O; *472*. *Cicuta maculata* L. – RU; O; *141*. **Cyclospermum leptophyllum* (Pers.) Sprague *ex* Britton & P. Wilson – RU; F; *423*, *550*. *Eryngium aromaticum* Baldwin – SH; O; *206*. *Eryngium baldwinii* Spreng. – PF, RU; O; *80*, *528*. *Eryngium yuccifolium* Michx. – PF, SH; O; *83*. *Hydrocotyle umbellata* L. – RU; O; *442*. *Hydrocotyle verticillata* Thunb. – RU; R; *L.J. Lehtonen 206*. *Oxypolis filiformis* (Walter) Britton subsp. *filiformis* – PF; R; *L.J. Lehtonen 358*. *Ptilimnium capillaceum* (Michx.) Raf. – PF; R; *L.J. Lehtonen 280*, *541*. *Spermolepis divaricata* (Walter) Raf. – RU; F; *488*.

APOCYNACEAE (including Asclepiadaceae). *Asclepias amplexicaulis* Sm. – SH; O; *498b*. *Asclepias cinerea* Walter – SH; O; *63*. *Asclepias humistrata* Walter – SH; O; *2*, *498a*. *Asclepias longifolia* Michx. – PF; R; *501*, *552*. *Asclepias pedicellata* Walter – PF; F; *180*. *Asclepias tuberosa* L. – PF, SH; O; *37*. *Asclepias verticillata* L. – PF, SH; O; *112*, *150*.

AQUIFOLIACEAE. *Ilex cassine* L. – CS, PF; O; *133*. *Ilex coriacea* (Pursh) Chapm. – CS; O; *312*. *Ilex glabra* (L.) A. Gray – PF; C; *44*. *Ilex opaca* var. *opaca* Aiton – CS, PF; O; *215*. *Ilex vomitoria* Aiton – PF; O; *340*.

ARACEAE (including Lemnaceae). **Colocasia esculenta* (L.) Schott – RU; C; *370*. *Lemna aequinoctialis* Welw. – CS, FD; C; *410*.

ARECACEAE. **Butia capitata* Becc. – RU; R; *500*. *Rhapidophyllum hystrix* (Pursh) H. Wendl. & Drude *ex* Drude – RU; R; *337*. *Sabal palmetto* (Walter) Lodd. *ex* Schult. & Schult. f. – PF, RU, SH; O; *444*. *Serenoa repens* (W. Bartram) Small – PF; C; *87*.

ASTERACEAE. *Acmella oppositifolia* (Lam.) R.K. Jansen var. *repens* (Walter) R.K. Jansen – RU; O; *404*. *Ageratina jucunda* (Greene) Clewell & Wooten – SH; C; *382*. *Ambrosia artemisiifolia* L. – RU; F; *392*. *Arnoglossum floridanum* (A. Gray) H. Rob. – SH; F; *115*. *Baccharis halimifolia* L. – RU, SH; O; *293*. *Balduina angustifolia* (Pursh) B.L. Rob. – SH; O; *28*, *130*, *223*. *Berlandiera subacaulis* (Nutt.) Nutt. – SH; F; *27*. *Bidens alba* (L.) DC. var. *radiata* (Sch. Bip.) R.E. Ballard *ex* Melchert. – RU; F; *54*.

Bidens laevis (L.) Britton et al. – RU; O; *405*. *Bidens mitis* (Michx.) Sherff – CS, RU; F; *363*, *377*. *Carphephorus corymbosus* (Nutt.) Torr. & A. Gray – SH; C; *250*. *Carphephorus odoratissimus* (J.F. Gmel.) H. Hebert – PF; F; *240*. *Carphephorus paniculatus* (J.F. Gmel.) H. Hebert – PF; F; *386*. *Chaptalia tomentosa* Vent. – PF; R; *415*. *Chrysopsis mariana* (L.) Elliott – SH; O; *101*, *362*. *Chrysopsis scabrella* Torr. & A. Gray – SH; C; *251*. *Chrysopsis subulata* Small – PF; F; *247*, *301*. *Cirsium horridulum* Michx. – PF, RU; F; *483*. *Cirsium nuttallii* DC. – RU; R; *77*. *Conyza canadensis* (L.) Cronquist var. *pusilla* (Nutt.) Cronquist – RU; O; *255*, *276*. *Eclipta prostrata* (L.) L. – RU; O; *598*. *Elephantopus elatus* Bertol. – PF, RU, SH; C; *172*. *Elephantopus nudatus* A. Gray – SH; O; *366*. **Emilia fosbergii* Nicolson – RU; R; *651*. *Erechtites hieracifolia* (L.) Raf. *ex* DC. – CS; C; *99*. *Erigeron quercifolius* Lam. – RU; C; *31*, *431*. *Erigeron strigosus* Muhl. *ex* Willd. – FD, RU; R; *543*. *Erigeron vernus* (L.) Torr. & A. Gray – PF, RU; O; *102*, *619*. *Eupatorium capillifolium* (Lam.) Small – RU, SH; F; *281*. *Eupatorium compositifolium* Walter – PF, RU, SH; C; *307*. *Eupatorium mohrii* Greene – PF; O; *76*, *134*, *177*. *Eupatorium pilosum* Walter – PF; O; *233*. *Eupatorium rotundifolium* L. – PF; F; *242*. *Euthamia caroliniana* (L.) Greene *ex* Porter & Britton – PF, RU, SH; F; *343*. *Gamochaeta falcata* (Lam.) Cabrera – PF; O; *486* (Wunderlin and Hansen 2003). *Gamochaeta pensylvanica* (Willd.) Cabrera – RU; O; *21* (Wunderlin and Hansen 2003). *Helianthus angustifolius* L. – PF; O; *237*, *590*. *Helianthus radula* (Pursh) Torr. and A. Gray – SH; O; *199*. *Hieracium gronovii* L. – PF, SH; C; *192*, *195*. *Hieracium megacephalon* Nash – SH; O; *34*, *108*. *Krigia virginica* (L.) Willd. – RU; O; *458*. *Lactuca canadensis* L. – PF; R; *L.J. Lehtonen 390*. *Lactuca graminifolia* Michx. – RU; F; *114*, *514*. *Liatris gracilis* Pursh – SH; C; *300*. *Liatris pauciflora* Pursh – SH; C; *225*. *Liatris tenuifolia* Nutt. var. *tenuifolia* – SH; C; *269*. *Lygodesmia aphylla* (Nutt.) DC. – SH; O; *24*. *Melanthera nivea* (L.) Small – RU; R; *227*. *Mikania scandens* (L.) Willd. – RU; O; *368*. *Oclemena reticulata* (Pursh) Greene – PF; R; *502*, *574* (Wunderlin and Hansen 2003). *Palafoxia integrifolia* (Nutt.) Torr. & A. Gray – SH; C; *249*. *Pityopsis graminifolia* (Michx.) Nutt. – SH; C; *197*. *Pluchea odorata* (L.) Cass. – FD; R; *L.J. Lehtonen 342*. *Pluchea rosea* R.K. Godfrey – FD; R; *92*, *246*. *Pseudognaphalium obtusifolium* (L.) Hillard & B.L. Burtt – PF; O; *221* (Wunderlin and Hansen 2003). *Pterocaulon pycnostachyum* (Michx.) Elliott – PF, RU; C; *29*. *Pyrrhopappus carolinianus* (Walter) DC. – RU; F; *539*, *544*. *Rudbeckia hirta* L. – SH; R; *L.J. Lehtonen 308*. *Sericocarpus tortifolius* (Michx.) Nees – PF, SH; C; *241* (Wunderlin and Hansen 2003). *Solidago fistulosa* Mill. – PF; O; *375*, *409*. *Solidago odora* Aiton var. *chapmanii* (Torr. & A. Gray) Cronquist – SH; C; *147*, *193*. *Solidago stricta* Aiton – PF; R; *L.J. Lehtonen 393*. *Solidago tortifolia* Elliott – SH; F; *268*. **Sonchus oleraceus* L. – RU; F; *422*, *516*. *Symphyotrichum adnatum* (Nutt.) G.L. Nesom – SH; O; *611* (Wunderlin and Hansen 2003). *Symphyotrichum concolor* (L.) G.L. Nesom – SH; O; *413* (Wunderlin and Hansen 2003). *Symphyotrichum dumosum* (L.) G.L. Nesom – PF, RU, SH; C; *391* (Wunderlin and Hansen 2003). *Symphyotrichum walteri* (Alexander) G.L. Nesom – PF; F; *243* (Wunderlin and Hansen 2003). *Verbesina heterophylla* (Chapm.) A. Gray – SH; O; *113*, *579*. *Vernonia angustifolia* Michx. – SH; R; *L.J. Lehtonen 310*. **Youngia japonica* (L.) DC. – RU; O; *381*.

BEGONIACEAE. **Begonia cucullata* Willd. – RU; O; *139*.

BIGNONIACEAE. *Campsis radicans* (L.) Seemann *ex* Bureau – PF; O; *89*.

BRASSICACEAE. *Descurainia pinnata* (Walter) Britton – RU; C; *427*. *Lepidium virginicum* L. – RU; O; *14*. **Raphanus raphanistrum* L. – RU; O; *56*.

BROMELIACEAE. *Tillandsia bartramii* Elliott – RU; R; *681*. *Tillandsia recurvata* (L.) L. – PF, RU; F; *278*. *Tillandsia usneoides* (L.) L. – PF, RU; C; *264*.

CACTACEAE. *Opuntia humifusa* (Raf.) Raf. – SH; F; *511*.

CAMPANULACEAE. *Lobelia glandulosa* Walt. – PF; O; *387*. *Lobelia paludosa* Nutt. – PF; O; *45*, *189*. *Triodanis perfoliata* (L.) Nieuwl. – RU; O; *434*. **Wahlenbergia marginata* (Thunb.) A. DC. – SH; R; *19*, *105*.

CANNABACEAE (Judd et al. 2002, as Celtidaceae; Stevens 2002). *Celtis laevigata* Willd. – PF; O; *346*.

CANNACEAE. *Canna flaccida* Salisb. – CS; F; *74*, *577*.

CAPRIFOLIACEAE. **Lonicera japonica* Thunb. – RU; O; *283*, *622*. *Lonicera sempervirens* L. – RU; O; *482*.

CARYOPHYLLACEAE. *Arenaria serpyllifolia* L. subsp. *serpyllifolia* – RU; O; *457b*. *Drymaria cordata* (L.) Willd. *ex* Schult. – RU; O; *468*. *Silene antirrhina* L. – RU; F; *545*. **Stellaria media* (L.) Vill. – RU; F; *457a*.

CHRYSOBALANACEAE. *Licania michauxii* Prance – SH; C; *51*.

CISTACEAE. *Helianthemum carolinianum* (Walter) Michx. – PF, SH; O; *649*, *L.J. Lehtonen 223a*. *Helianthemum corymbosum* Michx. – SH; O; *58*. *Lechea minor* L. – SH; F; *299*. *Lechea mucronata* Raf. – SH; O; *127*. *Lechea pulchella* Raf. – PF; R; *L.J. Lehtonen 336*. *Lechea sessiliflora* Raf. – SH; O; *152*, *459*. *Lechea torreyi* (Chapm.) Legg. *ex* Britton – PF; O; *451*.

CLUSIACEAE (including Hypericaceae; Judd et al. 2002). *Hypericum brachyphyllum* (Spach) Steud. – PF; R; *645*. *Hypericum cistifolium* Lam. – PF; O; *376*. *Hypericum crux-andreae* (L.) Crantz – PF; O; *201*. *Hypericum gentianoides* (L.) Britton et al. – SH; R; *L.J. Lehtonen 309*. *Hypericum hypericoides* (L.) Crantz – PF; F; *151*, *174*, *183*. *Hypericum mutilum* L. – RU; F; *562*. *Hypericum myrtifolium* Lam. – PF; O; *70*. *Hypericum tetrapetalum* Lam. – FD, PF; O; *187*.

COMMELINACEAE. *Callisia ornata* (Small) G.C. Tucker – SH; C; *40*. **Commelina benghalensis* L. – RU; R; *257*. *Commelina erecta* L. – RU, SH; O; *36*, *230*. **Murdannia nudiflora* (L.) Brenan – RU; F; *594*. *Tradescantia ohiensis* Raf. – RU; R; *88*, *229*.

CONVOLVULACEAE. *Cuscuta compacta* Juss. *ex* Choisy – PF; O; *356*. *Dichondra carolinensis* Michx. – RU; F; *315*. *Ipomoea cordatotriloba* Dennst. – RU; F; *274*. *Ipomoea pandurata* (L.) G. Meyer – SH; O; *117*. **Ipomoea quamoclit* L. – RU; O; *252*. *Ipomoea* cf. *sagittata* Poir. – RU; R; *643*. **Merremia dissecta* (Jacq.) Hallier f. – RU; R; *121*. *Stylisma patens* (Desr.) Myint – SH; O; *131*.

CORNACEAE (including Nyssaceae). *Cornus florida* L. – RU (possibly planted); O; *479*. *Nyssa sylvatica* Marshall var. *biflora* (Walter) Sarg. – CS, FD; C; *316, 606*.

CUCURBITACEAE. *Melothria pendula* L. – RU; O; *186*.

CYPERACEAE. **Bulbostylis barbata* (Rottb.) C.B. Clarke – RU; C; *164*. *Bulbostylis stenophylla* (Elliott) C.B. Clarke – RU; C; *157*. *Bulbostylis warei* (Torr.) C.B. Clarke – SH; F; *129*. *Carex elliottii* Schwein. & Torr. – RU; O; *530*. *Carex longii* Mack. – RU; R; *437, 563*. *Carex lupulina* Muhl. *ex* Willd. – RU; O; *525*. *Carex verrucosa* Muhl. – PF; F; *176*. *Cladium jamaicense* Crantz – CS; C; *553*. *Cyperus compressus* L. – RU; C; *166, 212a*. *Cyperus croceus* Vahl – RU; C; *23, 154, 208*. *Cyperus cuspidatus* Kunth – RU; O; *212b*. *Cyperus distinctus* Steud. – RU; O; *143*. *Cyperus filiculmis* Vahl – RU; O; *159b*. *Cyperus polystachyos* Rottb. – RU; C; *162*. *Cyperus retrorsus* Chapm. – RU; C; *104, 155, 159a, 211*. *Cyperus strigosus* L. – RU; O; *402*. *Eleocharis tuberculosa* (Michx.) Roem. & Schult. – RU; O; *529a*. *Eleocharis vivipara* Link – CS; C; *101, 557*. *Fimbristylis autumnalis* (L.) Roem. & Schult. – RU; R; *165*. *Fimbristylis caroliniana* (Lam.) Fernald – PF; R; *L.J. Lehtonen 260*. *Fuirena scirpoidea* Michx. – PF; F; *491*. *Kyllinga odorata* Vahl – RU; O; *167, 210*. **Kyllinga squamulata* Thonn. *ex* Vahl – RU; O; *644*. *Rhynchospora cephalantha* A. Gray – CS; O; *519, 558a*. *Rhynchospora corniculata* (Lam.) A. Gray – CS; O; *412*. *Rhynchospora fascicularis* (Michx.) Vahl – CS; F; *73, 188*. *Rhynchospora megalocarpa* A. Gray – SH; F; *495*. *Rhynchospora microcarpa* Baldwin *ex* A. Gray – CS; O; *556*. *Rhynchospora microcephala* (Britton) Britton *ex* Small – RU; R; *470*. *Rhynchospora wrightiana* Boeck. – CS; O; *558b*. *Scirpus cyperinus* (L.) Kunth – CS, RU; F; *280, 582*. *Scleria triglomerata* Michx. – PF; O; *504*.

DIOSCOREACEAE. **Dioscorea bulbifera* L. – RU; F; *218*.

DROSERACEAE. *Drosera brevifolia* Pursh – PF; F; *648*.

EBENACEAE. *Diospyros virginiana* L. – SH; F; *271*.

ERICACEAE. *Bejaria racemosa* Vent. – PF; F; *86*. *Gaylussacia dumosa* (Andrews) Torr. & A. Gray – SH; F; *9, 48*. *Gaylussacia nana* (A. Gray) Small – PF; F; *492* (Luteyn et al. 1996). *Gaylussacia tomentosa* (L.) Torr. & A. Gray *ex* Torr. – PF; C; *48* (Luteyn et al. 1996). *Kalmia hirsuta* Walter – PF; F; *84*. *Leucothoe racemosa* (L.) A. Gray – CS, PF; O; *330a*. *Lyonia fruticosa* (Michx.) G.S. Torr. – PF; C; *46*. *Lyonia ligustrina* (L.) DC. var. *foliosiflora* (Michx.) Fernald – PF; O; *559*. *Lyonia lucida* (Lam.) K. Koch – CS, PF; C; *43, 98, 331*. *Lyonia mariana* (L.) D. Don – PF; R; *566*. *Rhododendron viscosum* (L.) Torr. – PF; R; *118*. *Vaccinium arboreum* Marshall – PF, SH; F; *11, 305, 466*. *Vaccinium corymbosum* L. – PF; F; *284, 330b, 450, 474, 560* [our material included both the *V. fuscatum* Aiton entity (*330b, 474*) and the *V. ashei* (L.) Reade entity (*284, 450, 560, 564*; Uttal 1987)]. *Vaccinium myrsinites* Lam. – PF, SH; C; *426*. *Vaccinium stamineum* L. – PF, SH; C; *6, 8, 16*.

ERIOCAULACEAE. *Eriocaulon decangulare* L. – PF; F; *71*. *Lachnocaulon anceps* (Walter) Morong – PF; F; *448*. *Syngonanthus flavidulus* (Michx.) Ruhland – PF; F; *67, 429*.

EUPHORBIACEAE. *Acalypha gracilens* A. Gray – RU; C; *311*. **Aleurites fordii* Hemsl. – RU; F; *533*. *Chamaesyce hirta* (L.) Millsp. – RU; O; *332*. *Chamaesyce hypericifolia* (L.) Millsp. – RU; R; *407*. *Chamaesyce hyssopifolia* (L.) Small – RU; F; *256, 334, 335*. *Chamaesyce maculata* (L.) Small – RU; F; *333*. *Cnidoscolus stimulosus* (Michx.) Engelm. & A. Gray – RU, SH; C; *477*. *Croton argyranthemus* Michx. – SH; F; *5*. *Croton glandulosus* L. var. *glandulosus* – SH; O; *350*. *Croton michauxii* G.L. Webster – SH; O; *327*. *Euphorbia cyathophora* (Murray) Bartl. – RU; F; *394*. **Sapium sebiferum* (L.) Roxb. – RU; O; *467*. *Stillingia sylvatica* L. – PF, SH; F; *13*. *Tragia urens* L. – SH; O; *38*.

FABACEAE. *Aeschynomene viscidula* Michx. – SH; O; *125*. **Albizia julibrissin* Durazz. – RU; R; *401*. *Baptisia alba* (L.) Vent. – RU; R; *651*. *Centrosema virginianum* (L.) Benth. – SH, RU; O; *52*. *Cercis canadensis* L. – RU; R; *149*. *Chamaecrista fasciculata* (Michx.) Greene – RU; O; *203*. *Chamaecrista nictitans* (L.) Moench var. *nictitans* – SH; C; *194*. *Clitoria mariana* L. – PF, SH; F; *L.J. Lehtonen 250*. **Crotalaria pallida* Aiton var. *obovata* (G. Don) Polhill – RU; O; *219*. *Crotalaria rotundifolia* J.F. Gmel. – PF, RU, SH; C; *3, 22, 66*. *Dalea carnea* (Michx.) Poir. var. *albida* (Torr. & A. Gray) Barneby – SH; R; *D. & G. Place 380*. *Dalea carnea* (Michx.) Poir. var. *carnea* – SH; R; *326*. *Dalea pinnata* (J.F. Gmel.) Barneby var. *pinnata* – SH; C; *260*. *Desmodium ciliare* (Muhl. *ex* Willd.) DC. – SH; O; *341*. *Desmodium floridanum* Chapm. – SH; O; *110, 355*. *Desmodium incanum* DC. – RU; F; *123, 329, 351b*. *Desmodium lineatum* DC. – SH; F; *588*. *Desmodium paniculatum* (L.) DC. – SH; O; *351a*. *Desmodium tenuifolium* Torr. & A. Gray – PF, RU; F; *198*. **Desmodium tortuosum* (Sw.) DC. – RU; R; *L. Johnson s.n., 7 Sep 1982*. **Desmodium triflorum* (L.) DC. – RU; F; *548*. *Desmodium viridiflorum* (L.) DC. – RU, SH; O; *171*. *Erythrina herbacea* L. – SH; R; *505*. *Galactia regularis* (L.) Britton et al. – SH; F; *61, 116, 328*. *Galactia volubilis* (L.) Britton – SH; R; *L.J. Lehtonen 320*.**Indigofera hirsuta* L. – RU; F; *258*. **Indigofera spicata* Forssk. – RU; O; *361*. *Lespedeza hirta* (L.) Hornem. – SH; O; *259*. **Medicago lupulina* L. – RU; O; *461*. **Melilotus albus* Medik. – RU; F; *518*. *Mimosa quadrivalvis* L. var. *angustata* (Torr. & A. Gray) Barneby – SH; F; *30*. *Mimosa strigillosa* Torr. & A. Gray – RU; R; *614*. *Pediomelum canescens* (Michx.) Rydb. – SH; O; *7*. *Rhynchosia difformis* (Elliott) DC. – SH; R; *L.J. Lehtonen 460*. *Rhynchosia reniformis* DC. – SH; C; *4b*. *Rhynchosia tomentosa* (L.) Hook. & Arn. var. *tomentosa* – PF, SH; F; *4a, 512*. *Sesbania herbacea* (Mill.) McVaugh – RU; O; *397, 593*. **Sesbania punicea* (Cav.) Benth. – RU; F; *522*. *Stylosanthes biflora* (L.) Britton, Sterns & Pogg. – SH; C; *109*. *Tephrosia chrysophylla* Pursh – SH; O; *302*. *Tephrosia hispidula* (Michx.) Pers. – PF, SH; O; *200, 513*. **Wisteria sinensis* (Sims) Sweet – RU; F; *534*. *Zornia bracteata* J.F. Gmel. – SH; O; *107, 196*.

FAGACEAE. *Quercus ×asheana* Little (*Q. incana* × *Q. laevis*) – SH; R; *569*. *Quercus falcata* Michx. – RU (planted?); O; *481*. *Quercus geminata* Small – SH; O; *224*. *Quercus hemispherica* W. Bartram *ex* Willd. – SH; F; *128, 222* (Muller 1970). *Quercus incana* W. Bartram – SH; C.; *304, 380a*. *Quercus laevis* Walter – SH; C; *494*. *Quercus laurifolia* Michx. – RU; O; *535*. *Quercus minima* (Sarg.) Small – PF, SH; C; *298*. *Quercus myrtifolia* Willd. – SH; O; *303*. *Quercus nigra* L. – CS, RU; C; *277, 379*. *Quercus pumila* Walter – PF, SH; C; *94*. *Quercus virginiana* Mill. – RU; R; *476, 570*. *Quercus ×walteriana* Ashe (*Q. nigra* × *Q. laevis*) – SH; R; *288*.

GELSEMIACEAE. *Gelsemium sempervirens* (L.) W.T. Aiton – PF; F; *441*.

GENTIANACEAE. *Sabatia brevifolia* Raf. – PF; O; *604*.

GERANIACEAE. *Geranium carolinianum* L. – RU; R; *455*.

HAEMODORACEAE. *Lachnanthes caroliana* (Lam.) Dandy – CS, FD; C; *575*, *L.J. Lehtonen 366*.

HALORAGACEAE. *Proserpinaca palustris* L. – RU; R; *650*. *Proserpinaca pectinata* Lam. – FD; R; *L.J. Lehtonen 352*.

HYPOXIDACEAE. *Hypoxis juncea* Sm. – PF; F; *65*, *85*, *181*.

IRIDACEAE. *Iris hexagona* Walter – CS; R; *647*; both blue and white floral forms. *Sisyrinchium angustifolium* Mill. – PF; O; *446* [systematics of this group is unclear, and some systematists refer our plants to *S. atlanticum* E.P. Bicknell]. **Sisyrinchium rosulatum* E.P. Bicknell – RU; R; *L.J. Lehtonen 446*.

ITEACEAE. *Itea virginica* L. – CS; F; *97*, *509*.

JUGLANDACEAE. *Carya glabra* (Mill.) Sweet – RU; O; *496*.

JUNCACEAE. *Juncus elliottii* Chapm. – PF, SH; O; *75*, *503*. *Juncus marginatus* Rostk. – PF; O; *126*, *414*. *Juncus megacephalus* M.A. Curtis – RU; O; *421*, *519c*. *Juncus scirpoides* Lam. – PF; O; *185*.

KRAMERIACEAE. *Krameria lanceolata* Torr. – SH; R; *L.J. Lehtonen 447*.

LAMIACEAE. *Callicarpa americana* L. – PF; C; *90*. **Clerodendrum bungei* Steud. – RU; O; *537*. **Clerodendrum indicum* (L.) Kuntze – RU; O; *532*. *Hyptis alata* (Raf.) Shinners – RU; F; *228*, *235*. **Hyptis mutabilis* (Rich.) Briq. – RU; O; *226*, *395*, *424*. **Lamium amplexicaule* L. – RU; R; *454*. *Lycopus rubellus* Moench – CS; C; *214*. **Physostegia virginiana* (L.) Benth. – RU; R; *403*. *Pycnanthemum nudum* Nutt. – PF; R; *607*. *Salvia azurea* Michx. *ex* Lam. – SH; F; *272*. *Salvia lyrata* L. – RU; R; *310*. *Scutellaria integrifolia* L. – PF, SH; F; *344*. *Scutellaria multiglandulosa* (Kearney) Small *ex* R.M. Harper – SH; R; *42*, *238*. *Stachys floridana* Shuttlew. *ex* Benth. – RU; O; *400*. *Trichostema setaceum* Houtt. – SH; O; *248*.

LAURACEAE. **Cinnamomum camphora* (L.) J. Presl – RU; O; *373*. *Persea palustris* (Raf.) Sarg. – CS; C; *96*, *306*, *589*.

LENTIBULARIACEAE. *Pinguicula pumila* Michx. – PF; C; *388*, *417*. *Utricularia juncea* Vahl – PF; C; *389*. *Utricularia purpurea* Walter – FD; O; *617*. *Utricularia subulata* L. – PF; R; *L.J. Lehtonen 253*.

LOGANIACEAE. *Mitreola sessilifolia* (J.F. Gmel.) G. Don – FD; R; *L.J. Lehtonen 335*.

LYTHRACEAE. **Cuphea carthagenensis* (Jacq.) J.F. Macbr. – FD; R; *L.J. Lehtonen 204*.

MAGNOLIACEAE. *Magnolia grandiflora* L. – CS, RU; O; *279, 339*. *Magnolia virginiana* L. – CS; F; *573*.

MALVACEAE. *Sida rhombifolia* L. – RU; O; *393*.

MELANTHIACEAE. *Schoenocaulon dubium* (Michx.) Small – SH; C; *64*.

MELASTOMATACEAE. *Rhexia mariana* L. – PF, RU; F; *91, 95, 580*. *Rhexia nuttallii* C.W. James – PF; R; *L.J. Lehtonen 324*. *Rhexia petiolata* Walter – PF; R; *L.J. Lehtonen 314*.

MOLLUGINACEAE. **Mollugo verticillata* L. – RU; F; *549*.

MORACEAE. **Broussonetia papyrifera* (L.) Vent. – RU; R; *603*.

MYRICACEAE. *Myrica cerifera* L. var. *cerifera* – CS, PF, RU; C; *266* (Clewell 1985). *Myrica cerifera* L. var. *pumila* Michx. – PF; F; *453* (Clewell 1985).

NARTHECIACEAE. *Aletris obovata* Nash *ex* Small – SH; R; *680*.

NYCTAGINACEAE. *Boerhavia diffusa* L. – RU; O; *396*.

OLEACEAE. **Ligustrum lucidum* W.T. Aiton – RU; O; *425*. **Ligustrum sinense* Lour. – RU; O; *419*. *Osmanthus americanus* (L.) Benth. & Hook. f. *ex* A. Gray – PF; R; *561, 616*.

ONAGRACEAE. *Gaura angustifolia* Michx. – RU; F; *520*. *Ludwigia decurrens* Walter – RU; O; *398, 399, 620*. *Ludwigia erecta* (L.) H. Hara – RU; R; *599*. *Ludwigia maritima* R.M. Harper – PF; O; *231, 384, 578*. *Ludwigia palustris* (L.) Elliott – PF; R; *357, 487*. **Ludwigia peruviana* (L.) H. Hara – RU; O; *294*. *Ludwigia suffruticosa* Walter – RU; R; *L.J. Lehtonen 334, 334a*. *Oenothera laciniata* Hill – RU; F; *517*.

ORCHIDACEAE. *Pogonia divaricata* (L.) R. Br. – PF; R; *L.J. Lehtonen 264*. *Pteroglossaspis ecristata* (Fernald) Rolfe – SH; O; *170*. *Spiranthes vernalis* Engelm. & A. Gray – RU; R; *L.J. Lehtonen 274*.

OROBANCHACEAE. *Agalinis fasciculata* (Elliott) Raf. – PF; R; *L.J. Lehtonen 385*. *Agalinis filifolia* (Nutt.) Raf. – PF; O; *385*. *Agalinis linifolia* (Nutt.) Britton – FD, PF; O; *244*. *Agalinis purpurea* (L.) Pennell – CS; R; *M.S. Carrara 12, L.J. Lehtonen 409*. *Aureolaria pedicularia* (L.) Raf. var. *pectinata* (Nutt.) Gleason – SH; O; *10*. *Buchnera americana* L. – PF; O; *609, L.J. Lehtonen 239, 291*. *Seymeria cassioides* (G.F. Gmel.) S.F. Blake – PF, SH; F; *262*.

OXALIDACEAE. *Oxalis corniculata* L. – RU; O; *57, 624*. **Oxalis debilis* Kunth var. *corymbosa* (DC.) Lourteig – RU; O; *480*.

PAPAVERACEAE (including Fumariaceae). *Corydalis micrantha* (Engelm. *ex* A. Gray) A. Gray – RU; R; *L.J. Lehtonen 424*.

PASSIFLORACEAE. *Passiflora incarnata* L. – RU; O; *527*.

PHYLLANTHACEAE. **Phyllanthus urinaria* L. – RU; O; *408*.

PHYTOLACCACEAE. *Phytolacca americana* L. var. *rigida* Caulkins & Wyatt – RU; F; *531* (Caulkins and Wyatt 1990).

PLANTAGINACEAE. *Bacopa caroliniana* (Walter) B.L. Rob. – FD; R; *L.J. Lehtonen 354*. *Gratiola hispida* (Benth. *ex* Lindl.) Pollard – PF; O; *62, 313*. *Gratiola pilosa* Michx. – PF; R; *L.J. Lehtonen 321*. *Gratiola virginiana* L. – CS; R; *L.J. Lehtonen 435*. *Linaria canadensis* (L.) Chaz. – RU; O; *20, 484*. *Linaria floridana* Chapm. – SH; O; *L.J. Lehtonen 431*. *Penstemon australis* Small – SH; R; *L.J. Lehtonen 219*. *Plantago virginica* L. – RU; C; *435*. *Scoparia dulcis* L. – PF; O; *286, 591*. **Veronica arvensis* L. – RU; R; *456*. *Veronica peregrina* L. – RU; O; *439*.

POACEAE. *Amphicarpum muhlenbergianum* (Schult.) Hitchc. – CS; C; *510*. *Andropogon brachystachyus* Chapm. – PF, RU; R; *317, 634*. *Andropogon gerardii* Vitman – PF; F; *347, 360*. *Andropogon glomeratus* (Walter) Britton, Sterns & Poggenb. var. *glaucopsis* (Elliott) C. Mohr. – PF, SH; C; *342*. *Andropogon glomeratus* (Walter) Britton, Sterns & Poggenb. var. *glomeratus* – PF; F; *636*. *Andropogon glomeratus* (Walter) Britton, Sterns & Poggenb. var. *hirsutior* (Hack.) C. Mohr – PF; O; *132, 631*. *Andropogon glomeratus* (Walter) Britton, Sterns & Poggenb. var. *pumilus* (Vasey) Vasey *ex* L.H. Dewey – RU; F; *273, 627, 633*. *Andropogon gyrans* Ashe var. *gyrans* – SH; F; *383b*. *Andropogon ternarius* Michx. – SH; C; *60, 106*. *Andropogon virginicus* L. var. *glaucus* Hack. – PF; F; *632*. *Andropogon virginicus* L. var. *virginicus* – PF, RU, SH; F; *290, 635, 637, 639*. *Anthaenantia villosa* (Michx.) P. Beauv. – SH; R; *J.R. Abbott 9721*. *Aristida gyrans* Chapm. – SH; O; *318, 319*. *Aristida purpurascens* Poir. var. *tenuispica* (Hitchc.) Allred – PF; O; *629, 630*. *Aristida spiciformis* Elliott – PF; F; *291*. *Aristida stricta* Michx. var. *beyrichiana* (Trin. & Rupr.) D.B. Ward – PF, SH; C; *383a* (Ward 2001). *Arundinaria gigantea* (Walter) Walter *ex* Muhl. – RU; O; *613*. *Axonopus fissifolius* (Raddi) Kuhlm. – SH; F; *153, 349*. *Axonopus furcatus* (Flüggé) Hitchc. – RU; O; *568*. *Cenchrus echinatus* L. – RU; C; *55*. *Cenchrus incertus* M.A. Curtis – RU, SH; F; *122*. *Chasmanthium laxum* (L.) Yates var. *laxum* – SH; F; *352, 359*. *Ctenium floridanum* (Hitchc.) Hitchc. – SH; R; *J.R. Abbott 9719*. **Dactyloctenium aegyptium* (L.) Willd. *ex* Asch. and Schweinf. – RU. C. *253*. *Dichanthelium aciculare* (Desv. *ex* Poir.) Gould & C.A. Clark – SH; C; *507*. *Dichanthelium acuminatum* (Sw.) Gould & C.A. Clark var. *acuminatum* – SH; F; *209*. *Dichanthelium ensifolium* (Baldwin *ex* Elliott) Gould var. *ensifolium* – PF; R; *69*. *Dichanthelium laxiflorum* (Lam.) Gould – CS; F; *380b, 508*. *Dichanthelium ovale* (Elliott) Gould & C.A. Clark – SH; F; *1*. *Dichanthelium strigosum* (Muhl. *ex* Elliott) Freckmann var. *leucoblepharis* (Trin.) Freckmann – CS; O; *100, 297*. *Digitaria ciliaris* (Retz.) Koeler – RU; F; *292, 584*. **Echinochloa crusgalli* (L.) P. Beauv. – RU; F; *406, 585, 592*. **Eleusine indica* (L.) Gaertn. – RU; F; *168, 586*. **Eragrostis amabilis* (L.) Wight & Arn. – RU; O; *213*. *Eragrostis elliottii* S. Watson – SH; F; *261*. **Eremochloa ophiuroides* (Munro) Hack. – RU; C; *207, 295*. *Eustachys petraea* (Sw.) Desv. – RU, SH; F; *53b, 124*. *Gymnopogon ambiguus* (Michx.) Britton, Sterns & Poggenb. – SH; R;

J.R. Abbott 9722. Heteropogon melanocarpus (Elliott) Elliott *ex* Benth. – RU; O; *597.* **Lolium perenne* L. – RU; F; *546. Oplismenus hirtellus* (L.) P. Beauv. – RU; O; *642. Panicum anceps* Michx. – RU; O; *169, 182b, 324. Panicum hemitomon* Schult. – CS; C; *554.* **Panicum repens* L. – SH; F; *205. Panicum rigidulum* Bosc *ex* Nees – FD; O; *605. Panicum verrucosum* Muhl. – PF; O; *358.* **Paspalum notatum* Fluegge var. *saurae* Parodi – RU; F; *53a. Paspalum praecox* Walter – PF; R; *L. Johnson 14. Paspalum setaceum* Michx. – PF; F; *182a, 321.* **Paspalum urvillei* Steud. – RU, SH; O; *353, 521. Saccharum giganteum* (Walter) Pers. – PF; O; *374. Sacciolepis striata* (L.) Nash – CS; F; *216, 325. Schizachyrium scoparium* (Michx.) Nash var. *scoparium* – PF, SH; F; *638. Setaria corrugata* (Elliott) Schult. – PF; O; *178. Setaria parviflora* (Poir.) Kerguelen – RU; O; *138, 202. Sorghastrum secundum* (Elliott) Nash – PF, SH; C; *267.* **Sorghum halepense* (L.) Pers. – RU; F; *322, 540. Sphenopholis obtusata* (Michx.) Scribn. – RU; O; *438.* **Sporobolus indicus* (L.) R. Br. var. *indicus* – PF, RU; C; *120, 156, 348. Sporobolus juncea* (P. Beauv.) Kunth – SH; F; *506. Stenotaphrum secundatum* (Walter) Kuntze – RU; C; *323. Tridens flavus* (L.) Hitchc. – PF; O; *628. Triplasis americana* P. Beauv. – SH; R; *J.R. Abbott 9720a.* **Urochloa racemosa* (L.) Nguyen – RU; O; *583.*

POLYGALACEAE. *Polygala cymosa* Walter – FD; R; *L.J. Lehtonen 359, 450. Polygala grandiflora* Walter – PF, SH; O; *26, 82. Polygala incarnata* L. – SH; R; *587. Polygala lutea* L. – PF; R; *68. Polygala nana* (Michx.) DC. – PF; R; *184, 612. Polygala setacea* Michx. – PF; O; *179.*

POLYGONACEAE. *Eriogonum tomentosum* Michx. – SH; O; *191. Polygonella gracilis* Meisn. – SH; C; *263. Polygonum hydropiperoides* Michx. – RU; C; *411. Polygonum punctatum* Elliott – RU; R; *572. Rumex verticillatus* L. – RU; R; *433.*

PONTEDERIACEAE. *Pontederia cordata* L. – CS; R; *652.*

PORTULACACEAE. **Portulaca amilis* Speg. – RU; F; *515.*

RHAMNACEAE. *Berchemia scandens* (J. Hill) K. Koch – PF; R; *282. Ceanothus microphyllus* Michx. – SH; O; *336, 478.*

ROSACEAE. **Eriobotrya japonica* (Thunb.) Lindl. – RU; R; *640. Photinia pyrifolia* (Lam.) K.R. Robertson & J.B. Phipps – PF; O; *345. Prunus serotina* Ehrh. var. *serotina* – RU; F; *536, 571, 646. Prunus umbellata* Elliott – RU; R; *432. Rubus argutus* Link – PF; O; *338. Rubus cuneifolius* Pursh – PF, SH; C; *39.*

RUBIACEAE. *Cephalanthus occidentalis* L. – CS, FD; O; *81. Diodia teres* Walter – PF; O; *136, 175. Diodia virginiana* L. – FD; R; *542. Galium aparine* L. – RU; O; *443. Galium pilosum* Aiton – SH; O; *111. Houstonia procumbens* (J.F. Gmel.) Standl. – RU, SH; O; *430* (Wunderlin and Hansen 2003). *Mitchella repens* L. – CS, RU; O; *471.* **Oldenlandia corymbosa* L. – RU; R; 595 (Wunderlin and Hansen 2003). **Richardia brasiliensis* Gomes – RU; O; *18.* **Richardia scabra* L. – RU; R; *L.J. Lehtonen 462.*

RUTACEAE. *Zanthoxylum clava-herculis* L. – RU; R; *497.*

SALICACEAE. *Populus deltoides* W. Bartram *ex* Marshall – CS; R; *602*. *Salix caroliniana* Michx. – CS; F; *610*.

SAPINDACEAE (including Aceraceae). *Acer negundo* L. – RU; O; *524*. *Acer rubrum* L. – CS, RU; C; *296*, *460*.

SARRACENIACEAE. *Sarracenia minor* Walter – CS, PF; F; *72*.

SAURURACEAE. *Saururus cernuus* L. – CS, RU; O; *473*, *529b*.

SCROPHULARIACEAE. **Verbascum thapsus L.*—RU; O; *547*.

SMILACACEAE. *Smilax auriculata* Walter – PF, RU, SH; C; *12*, *32*, *50*. *Smilax bona-nox* L. – PF, RU; O; *372*. *Smilax glauca* Walter – PF, SH; C; *49*, *78*. *Smilax laurifolia* L. – CS; O; *308*, *449*. *Smilax smallii* Morong – PF; O; *567*. *Smilax walteri* Pursh – CS; R; *287*.

SOLANACEAE. *Physalis arenicola* Kearney – SH; R; *119*. *Solanum americanum* Mill. – RU; R; *499*.

TETRACHONDRACEAE. *Polypremum procumbens* L. – PF; O; *137*.

THEACEAE. *Gordonia lasianthus* (L.) J. Ellis – RU; O; *469*.

TURNERACEAE. *Piriqueta cistoides* (L.) Griseb. subsp. *caroliniana* (Walter) Urb. – PF, SH; F; *17* (Wunderlin and Hansen 2003).

ULMACEAE. *Ulmus alata* Michx. – RU; R; *420*.

URTICACEAE. *Boehmeria cylindrica* (L.) Sw. – RU; O; *140*, *314*. *Parietaria praetermissa* Hinton – RU; O; *440*.

VERBENACEAE. **Lantana camara* L. – RU; R; *146*. *Phyla nodiflora* (L.) Greene – RU; F; *35*, *144*. *Stylodon carneus* (Medik.) Moldenke – SH; O; *25*, *490*. **Verbena brasiliensis* Vell. – RU; O; *275*.

VIOLACEAE. *Viola lanceolata* L. – CS; O; *445*. *Viola palmata* L. – PF; O; *436*, *464*. *Viola primulifolia* L. – RU; R; *463*.

VISCACEAE (Judd et al. 2002). *Phoradendron leucarpum* (Raf.) Reveal & M.C. Johnst. – Parasite on *Quercus* sp. in CS; also parasite on *Nyssa sylvatica* var. *biflora* in FD; R; *428*, *618*.

VITACEAE. *Ampelopsis arborea* (L.) Koehne – RU; C; *565*, *596*. *Parthenocissus quinquefolia* (L.) Planch. – RU; C; *79*. *Vitis aestivalis* Michx. – RU; R; *625*. *Vitis rotundifolia* Michx. – RU; C; *47*.

XYRIDACEAE. *Xyris ambigua* Beyr. *ex* Kunth – CS; O; *234*. *Xyris brevifolia* Michx. – CS; R; *L.J. Lehtonen 439*. *Xyris caroliniana* Walter – FD, PF; F; *103*, *232*. *Xyris fimbriata* Elliott – RU; O; *581*. **Xyris jupicai* Rich. – PF; R; *J.R. Abbott 9728*. *Xyris platylepis* Chapm. – PF; R; *J.R. Abbott 9727*.